

THE ASTROPHYSICAL JOURNAL
CONTENTS OF VOLUME 510, PART 1

1999 JANUARY 1, Number 1

	<i>Page</i>
EFFECT OF VOID NETWORK ON COSMIC MICROWAVE BACKGROUND ANISOTROPY <i>Nobuyuki Sakai, Naoshi Sugiyama, & Jun'ichi Yokoyama</i>	1
ARGO COSMIC MICROWAVE BACKGROUND ANISOTROPY MEASUREMENT CONSTRAINTS ON OPEN AND FLAT- Λ COLD DARK MATTER COSMOLOGIES <i>Bharat Ratra, Ken Ganga, Radosław Stompor, Naoshi Sugiyama, Paolo de Bernardis, & Krzysztof M. Górski</i>	11
COSMOLOGY IN THE NEXT MILLENNIUM: COMBINING MICROWAVE ANISOTROPY PROBE AND SLOAN DIGITAL SKY SURVEY DATA TO CONSTRAIN INFLATIONARY MODELS <i>Yun Wang, David N. Spergel, & Michael A. Strauss</i>	20
REDSHIFT EVOLUTION OF THE NONLINEAR TWO-POINT CORRELATION FUNCTION <i>Chung-Pei Ma</i>	32
NEW LIMITS ON A COSMOLOGICAL CONSTANT FROM STATISTICS OF GRAVITATIONAL LENSING <i>Masashi Chiba & Yuzuru Yoshii</i>	42
GRAVITATIONAL LENSING LIMITS ON THE AVERAGE REDSHIFT OF GAMMA-RAY BURSTS <i>Daniel E. Holz, M. Coleman Miller, & Jean M. Quashnock</i>	54
THE RADIO WAVELENGTH TIME DELAY OF GRAVITATIONAL LENS 0957+561 <i>D. B. Haarsma, J. N. Hewitt, J. Lehar, & B. F. Burke</i>	64
THE INFRARED SURFACE BRIGHTNESS FLUCTUATION DISTANCES TO THE HYDRA AND COMA CLUSTERS <i>Joseph B. Jensen, John L. Tonry, & Gerard A. Luppino</i>	71
THE MORPHOLOGICALLY DIVIDED REDSHIFT DISTRIBUTION OF FAINT GALAXIES <i>Myungshin Im, Richard E. Griffiths, Avi Naim, Kavan U. Ratnatunga, Nathan Roche, Richard F. Green, & Vicki L. Sarajedini</i>	82
X-RAY PROPERTIES OF B2 1028+313: A QUASAR AT THE CENTER OF THE ABELL CLUSTER A1030 <i>Craig L. Sarazin, Anton M. Koekemoer, Stefi A. Baum, Christopher P. O'Dea, Frazer N. Owen, & Michael W. Wise</i>	90
THE IONIZING STARS OF EXTRAGALACTIC H II REGIONS <i>Fabio Bresolin, Robert C. Kennicutt, Jr., & Donald R. Garnett</i>	104
ON THE FORMATION OF DISK GALAXIES AND MASSIVE CENTRAL OBJECTS <i>J. A. Sellwood & E. M. Moore</i>	125
EFFECTS OF MAGNETIC FIELDS ON MASS ENTRAINMENT OF SUPERMAGNETOSONIC JETS <i>Alexander Rosen, Philip E. Hardee, David A. Clarke, & Audress Johnson</i>	136
ON THE ORIGIN OF DENSITY CUSPS IN ELLIPTICAL GALAXIES <i>Taro Nakano & Junichiro Makino</i>	155
HEAVY AND COMPLEX X-RAY ABSORPTION TOWARD THE NUCLEUS OF MARKARIAN 6 <i>J. J. Feldmeier, W. N. Brandt, M. Elvis, A. C. Fabian, K. Iwasawa, & S. Mathur</i>	167
X-RAY OBSERVATIONS OF THE SEYFERT GALAXY LB 1727 (1H 0419-577) <i>T. J. Turner, I. M. George, D. Grupe, K. Nandra, R. A. Remillard, K. M. Leighly, H. L. Marshall, S. B. Kraemer, & D. M. Crenshaw</i>	178
ON THE HADRONIC BEAM MODEL FOR GAMMA-RAY PRODUCTION IN BLAZARS <i>J. H. Beall & W. Bednarek</i>	188
H α EMISSION 11 KILOPARSECS ABOVE M82 <i>David Devine & John Bally</i>	197
GRAVITATIONAL MICROLENSING AND THE STRUCTURE OF THE INNER MILKY WAY <i>G. Gyuk</i>	205
CREATION OF ^7Li AND DESTRUCTION OF ^3He , ^9Be , ^{10}B , AND ^{11}B IN LOW-MASS RED GIANTS, DUE TO DEEP CIRCULATION <i>I.-Juliana Sackmann & Arnold I. Boothroyd</i>	217

	<i>Page</i>
THE CNO ISOTOPES: DEEP CIRCULATION IN RED GIANTS AND FIRST AND SECOND DREDGE-UP <i>Arnold I. Boothroyd & I.-Juliana Sackmann</i>	232
DETECTION OF H_2^+ IN THE DIFFUSE INTERSTELLAR MEDIUM: THE GALACTIC CENTER AND CYGNUS OB2 NUMBER 12 <i>T. R. Geballe, B. J. McCall, K. H. Hinkle, & T. Oka</i>	251
CLUSTERING PROPERTIES OF STARS IN SIMULATIONS OF WIND-DRIVEN STAR FORMATION <i>John Scalo & David Chappell</i>	258
THE MASS AND AGE OF VERY LOW MASS MEMBERS OF THE OPEN CLUSTER α PERSEI <i>Gibor Basri & Eduardo L. Martin</i>	266
GRAVITATIONAL COLLAPSE OF ISOTHERMAL MAGNETIZED CLOUDS: THE UNIVERSALITY OF SELF-SIMILAR COLLAPSE <i>Fumitaka Nakamura, Tomoaki Matsumoto, Tomoyuki Hanawa, & Kohji Tomisaka</i>	274
THE PERSEUS B5 MOLECULAR CLOUD HALO: MEASUREMENTS OF PRESSURE, TEMPERATURE, AND COMPOSITION <i>Peter Wannier, B-G Andersson, Bryan E. Penprase, & S. R. Federman</i>	291
TEMPORAL VARIABILITY OF THE X-RAY EMISSION OF THE CRAB NEBULA TORUS <i>C. Greiveldinger & B. Aschenbach</i>	305
A COMPLEXITY-BRIGHTNESS CORRELATION IN GAMMA-RAY BURSTS <i>Boris Stern, Juri Poutanen, & Roland Svensson</i>	312
LOW-DENSITY GRAPHITE GRAINS AND MIXING IN TYPE II SUPERNOVAE <i>Claudia Travaglio, Roberto Gallino, Sachiko Amari, Ernst Zinner, Stan Woosley, & Roy S. Lewis</i>	325
LINE-DRIVEN STELLAR WINDS: THE DYNAMICAL ROLE OF DIFFUSE RADIATION GRADIENTS AND LIMITATIONS TO THE SOBOLEV APPROACH <i>S. P. Owocki & J. Puls</i>	355
ASCA AND GINGA OBSERVATIONS OF GX 1+4 <i>Taro Kotani, Tadayasu Dotani, Fumiaki Nagase, John G. Greenhill, Steven H. Pravdo, & Lorella Angelini</i>	369
THE EXPULSION OF STELLAR ENVELOPES IN CORE-COLLAPSE SUPERNOVAE <i>Christopher D. Matzner & Christopher F. McKee</i>	379
ROSSI X-RAY TIMING EXPLORER OBSERVATION OF PSR B0656+14 <i>Hsiang-Kuang Chang & Cheng Ho</i>	404
COMETARY DUST IN THE DEBRIS DISKS OF HD 31648 AND HD 163296: TWO "BABY" β PICTORIS STARS <i>Michael L. Sitko, Carol A. Grady, David K. Lynch, Ray W. Russell, & Martha S. Hanner</i>	408
A TEST FOR CORONAL MAGNETIC FIELD EXTRAPOLATIONS <i>Jeongwoo Lee, Stephen M. White, Mukul R. Kundu, Zoran Mikić, & A. N. McClymont</i>	413
VELOCITIES IN SOLAR PORES <i>S. L. Keil, K. S. Balasubramaniam, L. A. Smaldone, & B. Reger</i>	422
FORMATION OF SOLAR PROMINENCES BY FLUX CONVERGENCE <i>K. Galsgaard & A. W. Longbottom</i>	444
INJECTION OF ≥ 10 MeV PROTONS IN ASSOCIATION WITH A CORONAL MORETON WAVE <i>Jarmo Torsti, Leon G. Kocharov, Matti Teittinen, & Barbara J. Thompson</i>	460
HEATING OF ERUPTING PROMINENCES OBSERVED AT 17 GHz <i>Yoichiro Hanaoka & Takehiko Shinkawa</i>	466
BRIGHT POINTS AND SUBFLARES IN ULTRAVIOLET LINES AND X-RAYS <i>M. Rovira, B. Schmieder, P. Démoulin, G. M. Simnett, M. J. Hagyard, E. Reichmann, & E. Tandberg-Hanssen</i>	474
A MODEL FOR SOLAR CORONAL MASS EJECTIONS <i>S. K. Antiochos, C. R. DeVore, & J. A. Klimchuk</i>	485
CHROMATIC HOLOGRAPHY OF THE SUNSPOT ACOUSTIC ENVIRONMENT <i>C. Lindsey & D. C. Braun</i>	494
THE PALOMAR TESTBED INTERFEROMETER <i>M. M. Colavita, J. K. Wallace, B. E. Hines, Y. Gursel, F. Malbet, D. L. Palmer, X. P. Pan, M. Shao, J. W. Yu, A. F. Boden, P. J. Dumont, J. Gubler, C. D. Koresko, S. R. Kulkarni, B. F. Lane, D. W. Mobley, & G. T. van Belle</i>	505
NEW INSTRUCTIONS TO AUTHORS—REVISED 1997 JUNE 1	i

CONTENTS

V

1999 JANUARY 10, Number 2

AN ISOCURVATURE COLD DARK MATTER COSMOGONY. I. A WORKED EXAMPLE OF EVOLUTION THROUGH INFLATION <i>P. J. E. Peebles</i>	Page 523
AN ISOCURVATURE COLD DARK MATTER COSMOGONY. II. OBSERVATIONAL TESTS <i>P. J. E. Peebles</i>	531
QUASI-NONLINEAR EVOLUTION OF STOCHASTIC BIAS <i>Atsushi Taruya, Kazuya Koyama, & Jiro Soda</i>	541
AN EFFICIENT TECHNIQUE TO DETERMINE THE POWER SPECTRUM FROM COSMIC MICROWAVE BACKGROUND SKY MAPS <i>Siang Peng Oh, David N. Spergel, & Gary Hinshaw</i>	551
NONNUCLEOSYNTHETIC CONSTRAINTS ON THE BARYON DENSITY AND OTHER COSMOLOGICAL PARAMETERS <i>Gary Steigman, Naoya Hata, & James E. Felten</i>	564
METAL ABUNDANCES AT $z < 1.5$: FRESH CLUES TO THE CHEMICAL ENRICHMENT HISTORY OF DAMPED Ly α SYSTEMS <i>Max Pettini, Sara L. Ellison, Charles C. Steidel, & David V. Bowen</i>	576
WHY QUASAR PAIRS ARE BINARY QUASARS AND NOT GRAVITATIONAL LENSES <i>C. S. Kochanek, E. E. Falco, & J. A. Muñoz</i>	590
CHEMICAL ENRICHMENT AT HIGH REDSHIFTS <i>Snigdha Das & Pushpa Khare</i>	597
GRAVITATIONAL LENSING IN QSO 1208+10 FROM THE PROXIMITY EFFECT IN ITS Ly α FOREST <i>E. Giallongo, A. Fontana, S. Cristiani, & S. D'Odorico</i>	605
THE CONCENTRATION-DENSITY RELATION OF GALAXIES IN THE LAS CAMPANAS REDSHIFT SURVEY <i>Yasuhiro Hashimoto & Augustus Oemler, Jr.</i>	609
JETS FROM TIME-DEPENDENT ACCRETION FLOWS ONTO A BLACK HOLE <i>Koji Nobuta & Tomoyuki Hanawa</i>	614
WHAT POWERS THE COMPACT RADIO EMISSION IN NEARBY ELLIPTICAL AND S0 GALAXIES? <i>Luis C. Ho</i>	631
THE DISKS OF GALAXIES WITH SEYFERT AND STARBURST NUCLEI. II. NEAR-INFRARED STRUCTURAL PROPERTIES <i>L. K. Hunt, M. A. Malkan, G. Moriondo, & M. Salvati</i>	637
OBSERVATION OF CENTAURUS A BY THE ROSSI X-RAY TIMING EXPLORER <i>R. E. Rothschild, D. L. Band, P. R. Blanco, D. E. Gruber, W. A. Heindl, D. R. MacDonald, D. C. Marsden, K. Jahoda, D. Pierce, G. Madejski, M. Elvis, D. A. Schwartz, R. Remillard, A. A. Zdziarski, C. Done, & R. Svensson</i>	651
STEPS TOWARD DETERMINATION OF THE SIZE AND STRUCTURE OF THE BROAD-LINE REGION IN ACTIVE GALACTIC NUCLEI. XV. LONG-TERM OPTICAL MONITORING OF NGC 5548 <i>B. M. Peterson, A. J. Barth, P. Berlind, R. Bertram, K. Bischoff, N. G. Bochkarev, A. N. Burenkov, F.-Z. Cheng, M. Dietrich, A. V. Filippenko, E. Giannuzzo, L. C. Ho, J. P. Huchra, J. Hunley, S. Kaspi, W. Kollatschny, D. C. Leonard, Yu. F. Malkov, T. Matheson, M. Mignoli, B. Nelson, P. Papaderos, J. Peters, R. W. Pogge, V. I. Pronik, S. G. Sergeev, E. A. Sergeeva, A. I. Shapovalova, G. M. Stirpe, S. Tokarz, R. M. Wagner, I. Wanders, J.-Y. Wei, B. J. Wilkes, H. Wu, S.-J. Xue, & Z.-L. Zou</i>	659
THE LUMINOUS STARBURST RING IN NGC 771: SEQUENTIAL STAR FORMATION? <i>Denise A. Smith, Terry Herter, Martha P. Haynes, & Susan G. Neff</i>	669
HUBBLE SPACE TELESCOPE IMAGES OF MAGELLANIC CLOUD PLANETARY NEBULAE: DATA AND CORRELATIONS ACROSS MORPHOLOGICAL CLASSES <i>L. Stanghellini, J. C. Blades, S. J. Osmer, M. J. Barlow, & X.-W. Liu</i>	687
RED PARKES QUASARS: EVIDENCE FOR SOFT X-RAY ABSORPTION <i>F. J. Masci, M. J. Drinkwater, & R. L. Webster</i>	703
FAST X-RAY TRANSIENTS AND GAMMA-RAY BURSTS: CONSTRAINTS ON BEAMING <i>Jonathan E. Grindlay</i>	710
A PATH INTEGRAL APPROACH TO THE THEORY OF HELIOSPHERIC COSMIC-RAY MODULATION <i>Ming Zhang</i>	715
MAGNETOHYDRODYNAMICS OF CLOUD COLLISIONS IN A MULTIPHASE INTERSTELLAR MEDIUM <i>Francesco Miniati, Dongsu Ryu, Andrea Ferrara, & T. W. Jones</i>	726

	Page
ISOLATED HOT STARS IN THE GALACTIC CENTER VICINITY <i>Angela S. Cotera, Janet P. Simpson, Edwin F. Erickson, Sean W. J. Colgan, Michael G. Burton, & David A. Allen</i>	747
³ He IN THE MILKY WAY INTERSTELLAR MEDIUM: ABUNDANCE DETERMINATIONS <i>Dana S. Balser, T. M. Bania, Robert T. Rood, & T. L. Wilson</i>	759
NEUTRAL-NEUTRAL REACTIONS IN THE INTERSTELLAR MEDIUM. II. ISOTOPE EFFECTS IN THE FORMATION OF LINEAR AND CYCLIC C ₃ H AND C ₃ D RADICALS IN INTERSTELLAR ENVIRONMENTS <i>R. I. Kaiser, C. Ochsenfeld, M. Head-Gordon, & Y. T. Lee</i>	784
THE MILLIMETER- AND SUBMILLIMETER-WAVE SPECTRUM OF METHYL MERCAPTAN (CH ₃ SH) <i>Fiona L. Bettens, K. V. L. N. Sastry, Eric Herbst, Sieghard Albert, Lee C. Oesterling, & Frank C. De Lucia</i>	789
HIERARCHICAL MODEL FOR THE EVOLUTION OF CLOUD COMPLEXES <i>Néstor M. Sánchez D. & Antonio Parravano</i>	795
MEASURING MOLECULAR, NEUTRAL ATOMIC, AND WARM IONIZED GALACTIC GAS THROUGH X-RAY ABSORPTION <i>John S. Arabadjis & Joel N. Bregman</i>	806
DOES " $\tau \approx 1$ " TERMINATE THE ISOTHERMAL EVOLUTION OF COLLAPSING CLOUDS? <i>Hirohiko Masunaga & Shu-ichiro Inutsuka</i>	822
MAGNETIC FIELD EFFECTS ON THE STRUCTURE AND EVOLUTION OF OVERDENSE RADIATIVELY COOLING JETS <i>Adriano H. Cerqueira & Elisabete M. de Gouveia Dal Pino</i>	828
GRAVITATIONAL RADIATION LIMIT ON THE SPIN OF YOUNG NEUTRON STARS <i>Nils Andersson, Kostas Kokkotas, & Bernard F. Schutz</i>	846
QUASI-NORMAL MODES OF ROTATING RELATIVISTIC STARS: NEUTRAL MODES FOR REALISTIC EQUATIONS OF STATE <i>Sharon M. Morsink, Nikolaos Stergioulas, & Steve R. Blattnig</i>	854
ACCRETION DISK BLOBS <i>Hideyuki Kamaya</i>	862
ON THE OCCURRENCE OF STREAM OVERFLOW IN CATAclysmic VARIABLES WITH ACCRETION DISKS <i>Frederic V. Hessman</i>	867
ROSSI X-RAY TIMING EXPLORER OBSERVATION OF CYGNUS X-1. II. TIMING ANALYSIS <i>Michael A. Nowak, Brian A. Vaughan, Jörn Wilms, James B. Dove, & Mitchell C. Begelman</i>	874
MAGNETIC ACCRETION AND PHOTOPOLARIMETRIC VARIABILITY IN CLASSICAL T TAURI STARS <i>Keivan Stassun & Kenneth Wood</i>	892
ULTRAVIOLET INTERSTELLAR LINEAR POLARIZATION. V. ANALYSIS OF THE FINAL DATA SET <i>P. G. Martin, Geoffrey C. Clayton, & Michael J. Wolff</i>	905
IMPLICATIONS OF 1.8 MeV GAMMA-RAY OBSERVATIONS FOR THE ORIGIN OF ²⁶ Al <i>Jürgen Knödseder</i>	915
COMPTONIZATION OF AN ISOTROPIC DISTRIBUTION IN MOVING MEDIA: HIGHER ORDER EFFECTS <i>Anthony Challinor & Anthony Lasenby</i>	930
THE TEMPERATURE SCALE OF METAL-RICH M GIANTS BASED ON TiO BANDS: POPULATION SYNTHESIS IN THE NEAR-INFRARED <i>R. P. Schiavon & B. Barbuy</i>	934
CARBON MONOXIDE FORMATION IN SN 1987A <i>Rob A. Gearhart, J. Craig Wheeler, & Douglas A. Swartz</i>	944
X-RAY EVIDENCE FOR WIND-WIND COLLISION IN THE WOLF-RAYET BINARY V444 CYGNI <i>Y. Maeda, K. Koyama, J. Yokogawa, & S. Skinner</i>	967
ROSSI X-RAY TIMING EXPLORER ALL-SKY MONITOR OBSERVATIONS OF THE 35 DAY CYCLE OF HERCULES X-1 <i>D. M. Scott & D. A. Leahy</i>	974
NEW INSIGHTS INTO THE LARGE 1992 JULY 15-17 FLARE ON AU MICROSCOPII: THE FIRST DETECTION OF POSTERUPTIVE ENERGY RELEASE ON A RED DWARF STAR <i>M. M. Katsova, J. J. Drake, & M. A. Livshits</i>	986
FORMATION CONDITIONS OF PRESOLAR TiC CORE-GRAPHITE MANTLE SPHERULES IN THE MURCHISON METEORITE <i>Takeshi Chigai, Tetuso Yamamoto, & Takashi Kozasa</i>	999

CONTENTS

vii

SURPRISINGLY INTENSE NEUTRON EMISSION FROM A FLARE BEHIND THE LIMB OF THE SUN <i>R. J. Murphy, G. H. Share, K. W. DelSignore, & X.-M. Hua</i>	<i>Page</i> 1011
JOINT INSTABILITY OF LATITUDINAL DIFFERENTIAL ROTATION AND TOROIDAL MAGNETIC FIELDS BELOW THE SOLAR CONVECTION ZONE. II. INSTABILITY FOR TOROIDAL FIELDS THAT HAVE A NODE BETWEEN THE EQUATOR AND POLE <i>Peter A. Gilman & Peter A. Fox</i>	1018
MAGNETIC ENERGY RELEASE IN DYNAMIC FAN RECONNECTION MODELS <i>I. J. D. Craig & A. N. McClymont</i>	1045
ULTRAVIOLET AND OPTICAL OBSERVATIONS OF A CORONAL TRANSIENT WITH <i>SOHO</i> <i>A. Ciaravella, J. C. Raymond, L. Strachan, B. J. Thompson, O. C. St. Cyr, L. Gardner, A. Modigliani, E. Antonucci, J. Kohl, & G. Noci</i>	1053
Fe xvii SOFT X-RAY LINES: THEORY AND DATA COMPARISONS <i>J. L. R. Saba, J. T. Schmelz, A. K. Bhatia, & K. T. Strong</i>	1064
EFFECTIVE COLLISION STRENGTHS FOR ELECTRON IMPACT EXCITATION OF FINE-STRUCTURE LEVELS IN Fe xi <i>G. P. Gupta & S. S. Tayal</i>	1078



